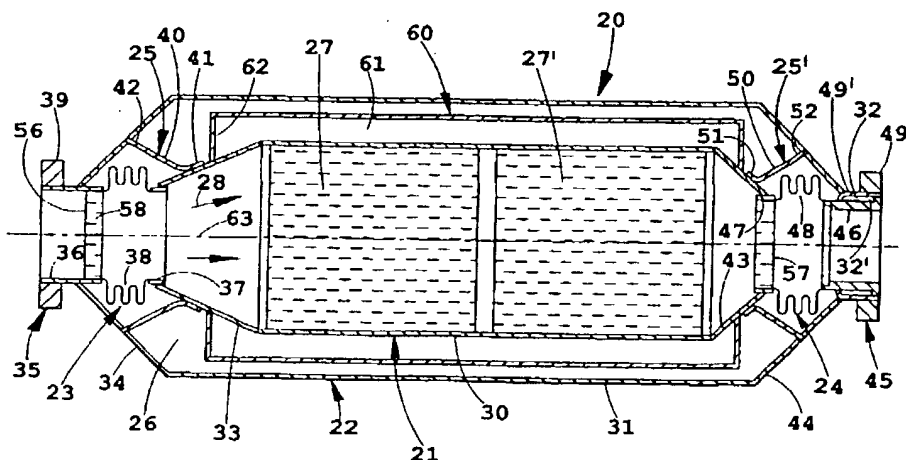




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(54) Title: VACUUM-INSULATED EXHAUST TREATMENT DEVICE WITH PHASE CHANGE MATERIALS AND THERMAL MANAGEMENT SYSTEMS



(57) Abstract

A thermally-activated exhaust treatment device, such as a catalytic converter (20) adapted to control exhaust emissions in a vehicle, includes a core having an inner housing (21) and a catalytic material (27) chosen to reduce undesirable emissions from the exhaust of a combustion engine. A jacket includes an outer housing (22) enclosing the inner housing (21) but characteristically not contacting the inner housing (21). The inner and outer housings (21, 22) include walls (30, 31) forming a vacuum-drawn sealed insulation cavity (26) around the inner housing (21). A chamber (60) positioned adjacent the inner housing (21) includes low melting point metal phase change material (61). A thermal management system is operably connected to the insulation cavity (26) that is constructed to control heat flow from the inner housing (21) to maximize the time the catalytic material (27) is within a predetermined optimum temperature operating range or limit catalyst maximum temperature.